REPORT DOCUMENTATION PAGE

Form Approved
OMB NO. 0704-0188

Public Reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comment regarding this burden estimates or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188,) Washington, DC 20503.

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE 2005-09-20	3. REPORT TYPE AND DATES COVERED Final Progress Report 10 July 03 - 9 June 05

4. TITLE AND SUBTITLE Statistical Evaluation and Modeling of Experimental Methods to Measure Deception	5. FUNDING NUMBERS DAAD190310214

6. AUTHOR(S) Stephen E. Fienberg	

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U. S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211	10. SPONSORING / MONITORING AGENCY REPORT NUMBER 45476.1-LS-DRP

11. SUPPLEMENTARY NOTES
      The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.

12 a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.	12 b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This project supports collaboration with Professor John T. Cacciopo of the Department of Psychology, University of Chicago in his investigations to determine whether semantic conditioning can be used to produce a bidirectional vasomotor/physiological response that otherwise would not occur (zero baserate), and if this work is successful to assist him in the implementation and evaluation of the application of these tools in the detection of deception. This work brings to bear standards of independent scientific evaluation of experimental efforts to detect deception consonant with the enunciated criteria in the Report of the NAS-NRC Committee to Evaluate the Scientific Evidence on the Polygraph. The project also involves the critical assessment of various methodologies for the detection of deception.

14. SUBJECT TERMS Polygraph, detection of deception, semantic conditioning			15. NUMBER OF PAGES
			16. PRICE CODE

17. SECURITY CLASSIFICATION OR REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION ON THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL

NSN 7540-01-280-5500

Standard Form 298 (Rev.2-89)
Prescribed by ANSI Std. 239-18
298-102

REPORT DOCUMENTATION PAGE (SF298)
(Continuation Sheet)

List of papers submitted or published that cite ARO support during this reporting period. List the papers, including journal references, in the following categories:

Number of Peer Reviewed Papers: 1

(a) Papers published in peer-reviewed journals (N/A for none)

Stephen E. Fienberg and Paul C. Stern (2005). "In Search of the Magic Lasso: The Truth About the Polygraph," *Statistical Science*, in press.

Number of Non Peer Reviewed Papers: 0

(b) Papers published in non-peer-reviewed journals or in conference proceedings (N/A for none)

Number of Papers not Published: 0

(c) Papers presented at meetings, but not published in conference proceedings (N/A for none)

Number of Manuscripts: 0

(d) Manuscripts submitted, but not published (N/A for none)

Stephen E. Fienberg (2005). "To Tell the Truth: On the Probative Value of Polygraph Search Evidence," *Jurimetrics*, submitted.

Honors and Awards

American Academy of Political and Social Science (Elected Fellow April 2004)
Royal Statistical Society (Elected Fellow November 2004)

Scientific progress and accomplishments (Description should include significant theoretical or experimental advances) This accepts plain text only. If you have pictures, graphs, formula's, etc. In a word document or other form, please use the attachment at the botton of this form and simply put "See Attachment" in the field below.

The principal activity of this project was to advise and comment on the research being done in the laboratory of John Cacioppo of the Department of Psychology, University of Chicago in his investigations to determine whether semantic conditioning can be used to produce a bidirectional vasomotor/physiological response that otherwise would not occur (zero base rate). I gave advice on the design of a series of preliminary experiments carried out in the Cacioppo laboratory and also worked with him and his staff to interpret and analyze the results. Some of this work was done remotely, but I visited Chicago three times for the project: In August 2003, April 2004 and shortly after the project ended in August 2005. During the most recent visit when we evaluated the labs most recent results I also offered advice on how to organize these for publication.

Cacioppo and I continue to work on the preparation of an article on how to carry out rigorous and scientifically-credible research on the detection of deception that will draw on material from the 2003 NAS-NRC study, *The Polygraph and Lie Detection*, on "Evaluating Methods for Detecting Deception."

During the past year I have completed two papers with support from this project, both of which were accepted for publication and one of which has just appeared in *Statistical Science* [Fienberg and Stern (2005)]. The other is scheduled to appear in Jurimetrics later this year [Fienberg (2005). During the contract period I also gave over a dozen lectures in at universities and professional meetings on the polygraph and the detection of deception.

List of faculty supported by the grant that are National Academy Members

Stephen E. Fienberg

Number of Patents Disclosed: 0

List of patent titles disclosed

Number of Patents Awarded: 0

List of patent titles awarded:

Technology Transfer (any specific interactions or developments which would constitute technology transfer of the research results). Examples include interaction with other DOD scientists, interactions with industry, initiation of a startup company based on research results or transfer of information which might impact the development of products.

Number of Graduate Students Supported: 0

Names of Graduate Students:

Number of Full Time Equivalent Graduate Students Supported: 0

Names of Full Time Equivalent Graduate Students:

Number of Post Doctorates Supported: 0

Names of Post Doctorates:

Number of Full Time Equivalent Post Doctorates Supported: 0

Names of Full Time Equivalent Post Doctorates:

Number of Faculty Supported: 1

Names of Faculty:
Stephen E. Fienberg

Number of Other Research Staff Supported: 0

Names of Other Research Staff Supported:

Number of Under Graduate Students Supported: 0

Names of Under Graduate Students:

Number of PHDs Awarded: 0

Names of personel receiving PHDs:

Number of Master Degrees Awarded: 0

Names of personel receiving Masters:

Statement of the problem studied:

This project supported collaboration with Professor John T. Cacioppo of the Department of Psychology, University of Chicago in his investigations to determine whether semantic conditioning can be used to produce a bidirectional vasomotor/physiological response that otherwise not occur (zero baserate), and if this work is successful to assist him in the implementation and evaluation of the application of these tools in the detection of deception. This work brought to bear standards of independent scientific evaluation of experimental efforts to detect deception consonant with the enunciated criteria in the Report of the NAS-NRC Committee to Evaluate the Scientific Evidence on the Polygraph. The project also involved the critical assessment of various methodologies for the detection of deception, including the polygraph and other technologies not studied in the Cacioppo laboratory.

Summary of the most important results:

The principal activity of this project was to advise and comment on the research being done in the laboratory of John Cacioppo of the Department of Psychology, University of Chicago in his investigations to determine whether semantic conditioning can be used to produce a bidirectional vasomotor/physiological response that otherwise would not occur (zero base rate). I gave advice on the design of a series of preliminary experiments carried out in the Cacioppo laboratory and also worked with him and his staff to interpret and analyze the results. Some of this work was done remotely, but I visited Chicago three times for the project: In August 2003, April 2004 and shortly after the project ended in August 2005. During the most recent visit when we evaluated the labs most recent results I also offered advice on how to organize these for publication.

Cacioppo and I continue to work on the preparation of an article on how to carry out rigorous and scientifically-credible research on the detection of deception. that will draw on material from the 2003 NAS-NRC study, *The Polygraph and Lie Detection*, on "Evaluating Methods for Detecting Deception." During the period of this contract we have seen the publications of new claims on the detection of deception that appear not to meet scientific standards described there; thus we believe that it is important to articulate these standards with illustrative examples for the broader scientific and policy communities. We will draw on the work in Cacioppo's lab as well as upon the other new claims to illustrate specific issues.

During the past year I have completed two papers with support from this project, both of which were accepted for publication and one of which has just appeared in *Statistical Science* [Fienberg and Stern (2005)]. The other is scheduled to appear in Jurimetrics later this year [Fienberg (2005). These papers utilize materials from the report of the NRC Committee on the Polygraph which I chaired and which lays out the scientific standards for assessing studies on the detection of deception as well as the basis for assessing the relevance of the accuracy information for different purposes. Many of the lessons found in these papers and in the original report are directly relevant to potential new tools for the detection of deception.

During the contract period I gave over a dozen lectures in at universities and professional meetings on the polygraph and the detection of deception.

Listing of all publications and technical reports supported under this grant or contract:

Papers published in peer-reviewed journals:
> Stephen E. Fienberg and Paul C. Stern (2005). "In search of the magic lasso: The truth about the Polygraph." *Statistical Science*, 20, 249-260.

Manuscripts accepted for publication:
> Stephen E. Fienberg (2005). "To tell the truth: On the probative value of polygraph search evidence." *Jurimetrics*, to appear.

List of all participating scientific personnel showing any advanced degrees earned by them while employed on the project

Stephen E. Fienberg